

The best exposed is in Oman ^{500 km long}

ophiolite

ophis - Greek - snake
lithos - rock

also occurrences in

Cyprus, Turkey,
Cyba, Newfoundland,
Philippines, New
Guinea, New Caledonia,
California (John
McPhoe)

"snake rock" - because of
scaly appearance and
greenish color - predominance
of olivine - itself
named after its color.

Rate of basalt generation on
all ridges is $\sim 16 \text{ km}^3/\text{yr}$
(^{many} times that on continents)

In detail the degree of partial melting (10% - 20%)
and the crustal thickness depend (weakly) upon the
spreading rate.

Seismic evidence
(on fast-spreading
ridges) shows
that the
axial magma
chamber
(AMC) is
very shallow

What does $T(z)$ look like
at deeper depths?
Uncertainties increase. Several
questions:

- (1) whole mantle or lower vs.
upper mantle convection

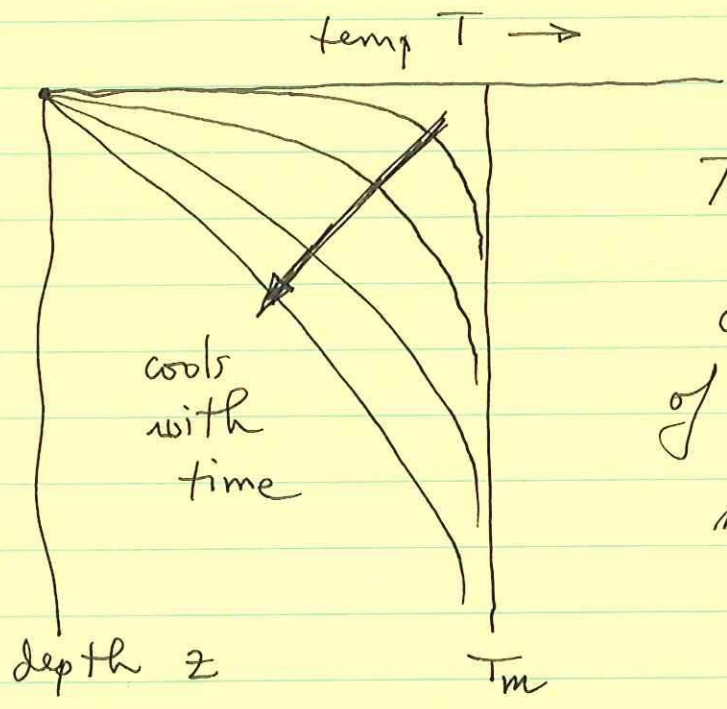
Presence of predominantly Fe ^{2900 km} depth
molten core provides a constraint

Solid inner core 5100 km depth

The upwelling material just beneath the ridge is very hot — for simplicity say it is a constant temperature — T_m all the way down.

$T_m \sim 1350^\circ\text{C}$ for mantle

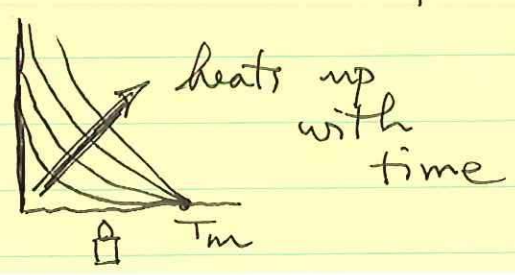
As the lithosphere spreads it cools off because it is cooled by the overlying seawater which is at $T \approx 0^\circ\text{C}$.



This is a simple problem — the conductive cooling of a half-space

many other physical applications of solution

e.g. if we turn problem around:



heating of a very thick skillet